

What is claimed is:

- 1           1.       A method of communicating in a mobile communications system,  
2 comprising:  
3               detecting that a first mobile station has stopped transmitting traffic  
4 containing real-time, interactive data on a first channel portion; and  
5               multiplexing traffic from a second mobile station on the first channel  
6 portion during a period in which the first mobile station is not transmitting traffic.
- 1           2.       The method of claim 1, further comprising receiving an indication that the  
2 first mobile station is starting to transmit traffic.
- 1           3.       The method of claim 2, further comprising allocating the first channel  
2 portion back to the first mobile station.
- 1           4.       The method of claim 1, wherein detecting that the first mobile station has  
2 stopped transmitting traffic comprises detecting that the first mobile station has entered a  
3 discontinuous transmission mode.
- 1           5.       The method of claim 4, wherein detecting that the first mobile station has  
2 entered discontinuous transmission mode comprises receiving a predetermined message  
3 indicating that the mobile station is entering the discontinuous transmission mode.
- 1           6.       The method of claim 1, wherein multiplexing the second mobile station  
2 traffic comprises receiving the second mobile station traffic on a predetermined time slot  
3 of a frame, the channel portion comprising the predetermined time slot.
- 1           7.       The method of claim 1, further comprising receiving a request from the  
2 first mobile station for the channel portion, the request indicating that the first mobile  
3 station is about to start transmitting traffic.

1           8.     The method of claim 7, wherein receiving the request comprises receiving  
2 a request that is one burst in length.

1           9.     The method of claim 8, wherein receiving the request comprises receiving  
2 a request that coincides with traffic from the second mobile station.

1           10.    The method of claim 9, further comprising extracting the request from a  
2 combined signal including the request and the traffic from the second mobile station.

1           11.    The method of claim 8, wherein receiving the request comprises receiving  
2 a request that is based on an identifier associated with the mobile station.

1           12.    The method of claim 11, wherein the identifier comprises a temporary  
2 flow identifier.

1           13.    The method of claim 11, wherein receiving the request comprises  
2 receiving a request that contains a coded version of the identifier, the coded version  
3 having a length that is longer than the identifier.

1           14.    The method of claim 7, wherein receiving the request comprises receiving  
2 the request during a period in which the second mobile station is transmitting traffic in  
3 the first channel portion.

1           15.    The method of claim 7, further comprising sending an assignment  
2 message to the first mobile station.

1           16.    The method of claim 15, wherein sending the assignment message  
2 comprises sending a one-burst assignment message.

1           17.    The method of claim 15, wherein sending the assignment message  
2 comprises sending a plural-burst assignment message.

1           18.    The method of claim 1, wherein detecting that the first mobile station has  
2 stopped transmitting traffic comprises receiving a General Packet Radio Service  
3 SID\_FIRST indication.

1           19.    The method of claim 18, further comprising receiving a Real-Time Fast  
2 Associated Control Channel resource request message from the first mobile station for re-  
3 assignment of the channel portion.

1           20.    The method of claim 19, further comprising sending a Real-Time Fast  
2 Associated Control Channel assignment message to the first mobile station to assign the  
3 channel portion back to the first mobile station.

1           21.    A system for use in a mobile communications system, comprising:  
2                a wireless interface adapted to communicate over a wireless channel  
3 portion with a first mobile station; and  
4                a controller adapted to detect if the first mobile station has entered into a  
5 discontinuous transmission mode and to allocate the wireless channel to another mobile  
6 station when the first mobile station is in the discontinuous transmission mode.

1           22.    The system of claim 21, wherein the wireless channel portion includes a  
2 time slot of a frame having plural time slots.

1           23.    The system of claim 21, further comprising a multiplexer to receive traffic  
2 from the first mobile station when the first mobile station is in an active mode and to  
3 receive traffic from the other mobile station when the first mobile station is in the  
4 discontinuous transmission mode.

1           24.    The system of claim 21, wherein the controller is adapted to detect a  
2 request from the first mobile station for re-allocation of the channel portion back to the  
3 first mobile station.

1           25.     The system of claim 24, wherein the request comprises a request carried in  
2     a General Packet Radio Service Real-Time Fast Associated Control Channel.

1           26.     The system of claim 25, wherein the request comprises a Real-Time Fast  
2     Associated Control Channel resource request message.

1           27.     The system of claim 24, wherein the controller is adapted to further send  
2     an assignment message to the first mobile station in response to the request.

1           28.     The system of claim 24, wherein the request has a length of one time slot  
2     of a frame.

1           29.     The system of claim 28, wherein the request is based on an identifier  
2     associated with the first mobile station.

1           30.     The system of claim 29, wherein the request is a coded version of the  
2     identifier associated with the first mobile station.

1           31.     The system of claim 24, wherein the request coincides with traffic from  
2     the other mobile station, the system further comprising a joint detector to extract the  
3     request from a combined message including the request and the traffic from the other  
4     mobile station.

1           32.     The system of claim 24, wherein the controller is adapted to receive the  
2     request during at the same time the controller is receiving traffic from the other mobile  
3     station.

1        ~~33.~~    A mobile station comprising:  
 2                a detector to detect when the mobile station is entering discontinuous  
 3 transmission mode;  
 4                a controller adapted to send an indication to a base station of the  
 5 discontinuous transmission mode to indicate that a channel portion assigned to the mobile  
 6 station is idle,  
 7                the controller adapted to further send a request for re-assignment of the  
 8 channel portion when the mobile station exits discontinuous mode.

1            34.    The mobile station of claim 33, wherein the controller is adapted to send  
 2 the indication according to a General Packet Radio Service protocol.

1            35.    The mobile station of claim 34, wherein the mobile station is associated  
 2 with temporary flow identifier, the request being based on the temporary flow identifier.

1            36.    The mobile station of claim 35, further comprising a storage unit to store  
 2 the temporary flow identifier, the mobile station keeping the temporary flow identifier  
 3 during discontinuous transmission mode.

1            37.    The mobile station of claim 33, wherein the controller is adapted to further  
 2 receive an assignment message responsive to the request and to transmit traffic on the  
 3 channel portion after receiving the assignment message.

1            38.    The mobile station of claim 33, wherein the channel portion comprises a  
 2 time slot of a frame.

1        ~~39.~~    A system for use in a mobile communications system, comprising:  
 2                a wireless interface adapted to communicate over a wireless channel  
 3 portion with one of a first mobile station and a second mobile station; and  
 4                a controller adapted to allocate the channel portion to the second mobile  
 5 station when the first mobile station is silent and to receive a request from the first mobile

station for allocation of the channel portion while concurrently receiving traffic from the second mobile station.

40. The system of claim 39, wherein the channel portion comprises a time slot of a frame having plural time slots.

41. The system of claim 39, wherein the request comprises a General Packet Radio Service Real-Time Fast Associated Control Channel message.

~~44.~~ An article comprising at least one storage medium containing instructions for communicating in a mobile communications network, the instructions when executed causing a system to:

detect a first mobile station entering discontinuous transmission mode, the first mobile station assigned a channel portion to communicate traffic; and

multiplex traffic from a second mobile station onto the channel portion during a time period in which the first mobile station is in discontinuous transmission mode.

45. The article of claim 44, wherein the instructions when executed cause the system to further receive a request from the first mobile station for a re-allocation of the channel portion.

46. The article of claim 45, wherein the channel portion comprises a time slot of a frame having plural time slots.

47. The article of claim 45, wherein the instructions when executed cause the system to receive the request from the first mobile station that overlaps traffic from the second mobile station.

receive traffic from the second mobile station during a time period in which the first mobile station is in discontinuous transmission mode.